CLAIMS

We claim:

1. A method of controlling copying of a video signal, comprising the acts of:

supplying the video signal;

embedding a watermark in the video signal; and

providing associated data in a predetermined location of the video signal, the associated data being related to the watermark in a predetermined manner.

2. The method of Claim 1, wherein the associated data is a cryptographic value.

3. The method of Claim 2, wherein the cryptographic value is a hash function of a seed, and the watermark is the hash function of the hash function of the hash function of the seed.

4. The method of Claim 1, wherein the predetermined location, for NTSC TV, is video line 21.

5. An apparatus for processing an input video signal to control subsequent copying thereof, comprising:

a seed generator;

a hash function generator coupled to receive a seed from the seed generator and output resulting data;

a watermark generator coupled to receive the seed and generate a watermark from the seed, and to embed the watermark in a picture portion of the input video; and

a transmission channel coupled to transmit the resulting data and the watermarked video to a receiver, the resulting data being transmitted other than in a picture portion of the video.

6. The apparatus of Claim 5, wherein the watermark is the hash function of the hash function of the hash function of the seed.

7. A method of controlling copying of a video signal having an embedded watermark and associated data, comprising the acts of:

determining if recording of the video is to be permitted; and

only if recording is permitted, transmitting the video signal and the associated data, wherein the watermark has a predetermined relationship to the associated data.

8. The method of Claim 7, wherein the associated data is a cryptographic value.

9. The method of Claim 8, wherein the cryptographic value is a hash function of a seed, and the watermark is the hash function of the hash function of the hash function of the seed.

10. The method of Claim 7, further comprising the acts of:

deciding if the recording is to be permitted;

reporting that recording is to be permitted; and

charging a fee for permitting the recording.

11. A set top box for connection to a television receiver, comprising:

an input terminal adapted to receive a video signal including a watermark and to receive associated data;

a conditional access control, having a control terminal for receiving a user selection for enabling recording of the video signal; and

a combiner having a control terminal coupled to an output terminal of the conditional access control and receiving the video signal from the input terminal, and having an output terminal, wherein the combiner outputs the video signal with or without the associated data in response to the conditional access control.

12. The set top box of Claim 11, further comprising:

a connection to an uplink, and wherein the conditional access control transmits to the uplink an indication of user selection.

13. The set top box of Claim 11, wherein the associated data is a cryptographic value.

14. The set top box of Claim 11, further comprising a video recorder coupled to record the output video signal.

15. A method of operating a video recorder, comprising the acts of:

receiving an input video signal having a watermark;

detecting the watermark;

detecting data associated with the video signal;

subjecting the data to a predetermined compression function; and

allowing recording of the input video signal only if the detected watermark matches the result of the compression function.

16. The method of Claim 15, wherein the compression function is a multiple hash function.

17. The method of Claim 15, wherein the data is on a predetermined video line in the vertical blanking interval of the video signal.

18. The method of Claim 15, wherein the data is a cryptographic value.

19. A video recorder, comprising:

an interface to a recording medium;

an input port for receiving a video signal to be recorded on the medium;

a watermark detector coupled to the input port;

a data detector coupled to the input port to detect data at a predetermined location in the video signal; and

a processor coupled to compare the detected watermark to a compression function of the data, and to enable recording of the video signal onto the medium if the comparison is a match.

20. The video recorder of Claim 19, wherein the compression function is a hash function of a hash function of the data.

21. The video recorder of Claim 19, wherein the data is a cryptographic value.

22. A method of controlling playing of a video signal recorded on a medium, comprising the acts of:

playing the video signal from the media;

detecting a watermark in the video signal;

detecting data associated with the video signal;

subjecting the data to a compression function; and

allowing further playing of the video signal only if the watermark matches the compression function of the data.

23. The method of Claim 22, further comprising the act of applying an analog copy protection signal to the played video.

24. The method of Claim 22, wherein the compression function is a hash function.

25. The method of Claim 22, wherein the data is a cryptographic value.

26. A video player comprising:

an interface to a recording medium which outputs a video signal;

a watermark detector coupled to receive the video signal;

a data detector coupled to detect a data associated with the video signal;

a processor coupled to the watermark detector and data detector and which subjects the detected data to a compression function and compares the watermark to the compressed function of the data and allows further playing only if the comparison is a match.

27. The video player of Claim 26, wherein the compression function is a hash function of a hash function.

28. The video player of Claim 26, wherein the data is a cryptographic value.

29. A method of controlling copying of a video or audio signal, comprising the acts of:

supplying the audio or video signal;

embedding a first watermark in the audio or video signal;

transmitting the video or audio signal to a user; and

embedding a second watermark in the video or audio signal in response to an action by the user.

30. The method of Claim 29, where the action by the user is an indication relating to payment.

31. A method of controlling copying of a video or audio signal having an embedded watermark, comprising the acts of:

determining if recording of the video or audio signal is to be prevented;

if recording is to be prevented, adding a second watermark; and

transmitting the video or audio signal with the first and second watermarks.

32. The method of Claim 31, further comprising the acts of:

deciding if the recording is not to be prevented;

reporting that recording is not to be prevented; and

charging a fee for not preventing the recording.

33. The method of Claim 31, further comprising the acts of:

if recording is permitted, recording the audio or video signal; and

adding to the recorded audio or video signal the second watermark.

34. A set top video or audio box for connection to an associated receiver, comprising:

an input terminal adapted to receive a video or audio signal;

a conditional access control having a control terminal for receiving a selection enabling recording of the video or audio signal;

a watermark embedder for embedding a second watermark and having a control terminal coupled to an output terminal of the conditional access control and receiving the video or audio signal from the input terminal, and having an output terminal, wherein the video or audio signal

includes a first watermark; wherein the watermark embedder outputs the video or audio signal with the first and second watermarks in response to the conditional access control.

35. The set top box of Claim 34, further comprising:

a connection to an uplink or computer network, wherein the conditional access control transmits on the uplink/network an indication of the selection.

36. A method of operating a video or audio recorder, comprising the acts of:

receiving an input audio or video signal having a first and a second watermark;

detecting the watermarks;

preventing recording of the input video or audio signal if both the first and second watermarks are detected.

37. A video or audio recorder, comprising:

an interface to recording medium;

an input port for receiving a video or audio signal to be recorded;

a watermark detector coupled to the input port; and

a processor coupled to receive an indication of detected watermarks, and to prevent recording of the video or audio signal onto the media if two predetermined watermarks are detected.

38. The video or audio recorder of Claim 37, further comprising a watermark embedder operatively coupled to the processor.

39. A method of controlling playing of a video or audio signal recorded on a medium, comprising the acts of:

playing the video or audio signal from the medium;

detecting any watermarks in the video or audio signal; and

preventing further playing of the video or audio signal if detected watermarks match respectively two predetermined watermarks.

49. The method of Claim 39, further comprising the act of applying an analog copy protection signal to the played video or audio signal.